



EUCLID CHEMICAL

EUCON INTEGRAL ARC

Alkali Silica Reactivity Control Admixture

Description

EUCON INTEGRAL ARC is a lithium nitrate based, specially formulated admixture designed to control alkali-silica reactivity (ASR) in concrete. When reactive silica has sufficient alkalies and moisture, a damaging expansive gel forms. This expansion will result in cracking and premature deterioration of concrete. Alkali-silica reactivity can be controlled when EUCON INTEGRAL ARC is introduced as an admixture in concrete at recommended doses. Dosages will vary depending on the sodium equivalent of the cement and when used in combination with pozzolans such as Class F fly ash.

Primary Applications

- Highways and bridges
- Airport runways
- Water treatment facilities
- Warehouses
- Energy/Power facilities
- Commercial buildings
- Piers and docks

Features/Benefits

- Mitigates ASR expansion and cracking
- Eliminates ASR-induced popouts
- No adverse effect on plastic or hardened concrete properties
- Easy to handle
- Use of available local materials
- Increases life span of concrete
- Can be used with appropriate pozzolans

Technical Information

Physical Properties

Material..... Lithium Nitrate
 Specific Gravity @ 77°F (25°C)..... 1.20
 Freezing Point 1.4°F (-17°C)
 Boiling Point 230°F (110°C)

Packaging

EUCON INTEGRAL ARC is available in 55 gallon (208 L) drums, 275 gallon (1041 L) totes, and bulk.

Shelf Life

2 years when stored above 32°F (0°C) in original, unopened container.

Specifications/Compliances

- ANSI/NSF STD 61
- Meets ASTM C 494 Types S

Directions for Use

EUCON INTEGRAL ARC is dosed based on the amount of sodium equivalent $^{**}(\text{Na}_2\text{Oe})$ in cement. To control alkali-silica reactivity in concrete, add 0.55 gal of Eucon Integral ARC per pound of sodium equivalent in your cement. To maintain the same water to cement ratio subtract 0.85 gallons of mix water for each gallon of Eucon Integral ARC added.

Calculation to determine dosage rate of Eucon Integral ARC (English Units)

1. Consult the cement producer to determine the sodium equivalent in the cement. This amount is usually expressed as Na_2Oe , or "total alkali content" on the certificate of analysis.
2. Convert the sodium equivalent into a decimal. An example would be 0.6% $\text{Na}_2\text{Oe}=0.006$ (conversion is as easy as moving the decimal to the left two places.)
3. Multiply the weight of the cement by 0.006. This number represents the amount of sodium equivalent needed to be treated in your concrete mixture. An example would be: $611 \text{ (lbs of cement / yd}^3\text{)} \times 0.006$ (sodium equivalent in cement) = 3.666 (this number represents the pounds of sodium equivalent in your mix).
4. The Euclid Chemical Company recommends treating the sodium equivalent with 0.55 gallons of Eucon Integral ARC. Multiply 3.666×0.55 (recommended dose rate of ARC)=2.01 (gallons added per cubic yard of concrete).
5. For every gallon of Eucon Integral ARC added to a concrete mix, some water must be removed. Using the example from above, calculate your water adjustment by multiplying the number of gallons of Eucon Integral ARC by 0.85. This will give the amount of water (in gallons) subtracted from the original water requirements. Example: $2.01 \text{ (gallons of Integral ARC)} \times 0.85 = 1.71$ gallons (water subtracted from the mix design).

$$^{**}\text{Sodium equivalent } (\text{Na}_2\text{Oe}) = \% \text{Na}_2\text{O} + 0.658 \times \% \text{K}_2\text{O}.$$

Calculation to determine dosage rate of Eucon Integral ARC (Metric Units)

1. Consult your cement producer to determine the sodium equivalent in your cement. This amount is expressed as Na_2Oe , or "Total alkali content" on the certificate of analysis. The dosage rate of EUCON INTEGRAL ARC is 4.63 L per kg of sodium equivalent in your cement.
2. Convert the sodium equivalent into a decimal. An example would be 0.6% $\text{Na}_2\text{Oe}=0.006$ (conversion is as easy as moving decimal to the left two places).
3. Multiply the weight of the cement by 0.006. This number represents the amount of sodium equivalent that needs to be treated in your concrete. An example would be $362.5 \text{ (kg of cement/m}^3\text{)} \times 0.006$ (sodium equivalent in cement)=2.175 (this number represents the kg of sodium equivalent needed to be treated in your concrete).
4. The Euclid Chemical Company recommends treating the sodium equivalent with 4.63 liter of EUCON INTEGRAL ARC. Multiply $2.175 \times 4.63 = 10.07$ (liter added per m^3 of concrete).
5. For every liter of EUCON INTEGRAL ARC added to a concrete mix, some water must be removed from the mix design. Subtract 0.85 liter of water from the mix for every liter of EUCON INTEGRAL ARC added. Example: $10.07 \text{ liters (liters of EUCON INTEGRAL ARC)} \times 0.85 = 8.56$ (liters of water subtracted from the mix design).

Calculation to determine dosage rate with pozzolans

Eucon Integral ARC dosages can be lowered when combined with suitable pozzolans such as Class F fly ash. Dosage reduction is dependent on the composition of the pozzolan, reactivity of the aggregate and overall mix design. Preliminary testing is highly recommended to determine optimum dosage rate. Consult your Euclid Chemical Company representative for dosing instructions and calculations.

Eucon Integral ARC is safe to use and requires no special equipment. Add Eucon Integral ARC with the original charge of mix water. Do not add directly to cement. Mix for a minimum of 3 minutes.

Precautions / Limitations

- Keep from freezing.
- Pre-job meetings and preliminary test pours should be performed in order to ensure appropriate fresh concrete properties response to the dosage rates prescribed.
- EUCON INTEGRAL ARC can act as an oxidizer if allowed to evaporate and form crystals.
- Store in a cool, dry area in a tightly sealed container. Keep separate from combustible, organic and oxidizable materials. Always reseal containers after use.
- In all cases, consult the Safety Data Sheet before use.

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